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PLATFORM
[Løbebro]

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The invention concerns a platform consisting of flat elements which are supported by crossbeams at the adjoining ends, and which are held together with the aid of U-shaped loops.

/1*

In the case of some of the known scaffolds of this type, the legs of the U-shaped loops are sharpened, so that the loops can be driven into the flat elements, one leg of each loop being driven into the flat element near the end while the other leg of the loop is driven into that flat element supporting the same. The leg of the loop is not long enough for it to penetrate the flat element entirely. This method of assembly has the disadvantage that the flat elements, which usually consist of flat planks, are very quickly destroyed by driving in the legs of the loops. After being used 4-5 times, there are so many holes in the planks that they must be discarded.

In the case of another known platform, the flat elements are held together with the aid of fittings that are screwed or bolted together with the flat elements. Such platforms are rather difficult to set up, and moreover it is unfortunate that the bolts or screws or other threaded parts used, cannot be kept free of mortar and furthermore quickly rust in the open air.

The invention has for its goal the improvement of the platform in such a way that it can be set up easily and quickly, without the need to drive nails or other fastening devices into the material of the flat elements, the flat elements being

*Numbers in the margin indicate pagination in the foreign text.

assembled in such a way that a lengthwise movement of the flat elements relative to the crossbeams is prevented.

The platform according to the invention has the obvious characteristic that one or more holes is formed at each end of each flat element, which lie so far from the end of the element that they are not covered by the crossbeam, and that the legs of the U-shaped loops inserted in these holes extend downward a short distance below the underside of the elements. During the assembly of the flat elements, one leg of a U-shaped loop is pushed down through a hole in one a flat element, while the other leg of the loop, is pushed down into the opposing hole in the adjacent flat element. Assembly is thus very easily and quickly carried out. Because the legs extend downward a short distance below the underside of the flat elements, the legs will lock the flat elements in position relative to the crossbeams, extending down along each side of it. With the use of said holes in the flat elements, the need to use nails or other fastenings that are driven into the wood is completely avoided. As a result, the flat elements have a longer working life, in certain cases 10 - 20 times longer than that of flat elements which are nailed to the crossbeams. Due to the holes in the flat elements, the U-shaped loops can also be produced very simply, for example, merely by bending a piece of iron rod.

In order to obtain a partial or complete countersinking of the loops into the flat elements, so that the latter will produce a flat surface, a recess can, according to the invention, be

formed in one or both sides of each flat element, extending from each hole up to the edge at the end. This recess has a width at least equal to the width of the connecting part of the U-shaped loop between the legs, and a depth essentially equal to the height of the U-shaped connecting part of the U-shaped loop between the legs, said flat element in this case being essentially thicker than the overall depth of the recesses. As indicated, if the recesses are formed in both sides of each flat element, the flat elements can be turned over after some time in use, when they become worn or damaged on the upper side. Their working life can thus be extended still further. /2

In the case of most of the known platforms, each of the flat elements consists of several planks laid side by side, which are pierced and held together by a transverse binding iron at each end of the element. In this case, due to the invention, the holes in the flat elements can be located inside the binding irons, effectively preventing the material between the hole and the nearby end edge of the flat element from being torn out by overloading the connection between two elements or the effect of bumps or blows.

When said binding irons are used, each of the holes in the flat elements can, according to the invention, can be bounded by the inner part of a slot through the entire thickness of the element, extending from the end of the element and by a binding iron passing crosswise through the slot. This saves the trouble of boring holes and cutting recesses from the holes to the end

edges of the element. Instead, merely a slot of the cited type is cut all the way through, which is much easier. The connecting parts of the U-shaped loops will be sufficiently countersunk in the elements, when they rest on the binding irons which are usually driven through the center of the thickness of the elements.

The invention is illustrated schematically in the drawings, where:

Fig. 1 is a perspective view of part of a masonry wall with a scaffold equipped with a platform according to the invention,

Fig. 2 is a lengthwise section through the platform on a larger scale,

Fig. 3 shows a part of the platform, seen from above,

Fig. 4 shows an end portion of a flat element, seen from above,

Fig. 5 is a section along lines V-V in Fig. 4, and

Fig. 6 is a section along lines VI-VI in Fig. 4.

On the drawings, **1**, **2**, **3** and **4** indicate planks which are joined together near each end with a connecting iron 5 in the form of a twisted iron rod with a square cross section. The binding irons **5** are driven through the cylindrical holes **7** in the planks. There are slots **8** and **9** in the planks **1** and **4** which extend a short distance past the binding irons **5**. Thus, produced are flat elements which are labeled **10** and **11** in Figs. 1 and 3. These are installed with their ends resting on beams **12**, **13** and **14**, which are supported partly in the masonry **15**, partly on

uprights **16**, **17** and **18**. Two flat elements are installed with their ends abutting. A U-shaped loop, with two branches **19** and **20** and connecting part **21** interlock with the binding irons **5** in the two flat elements **10**, **11**; and the branches **19** and **20** extend downward on either side of the beams, as seen in Fig. 2. The connecting pieces **21** lie countersunk in the slots **8** and **9**, so that no part projects past the top surface of the flat elements. A completely flat platform therefore results.

Patent Claims

1. Platform consisting of flat elements, supported by crossbeams at the abutting ends, and which are held together in the lengthwise direction with the aid of U-shaped loops, *characterized by the fact* that one or more holes is formed at each end of each flat element, which lie so far from the end of the element that they are not covered by the cross beams, and that the legs of U-shaped loops inserted in these holes extent a short distance below the underside of the elements.

2. Platform according to Claim 1, *characterized by the fact* that a recess is formed in one or both ends of each flat element, from each hole to the edge at the end, which recess has a width at least equal to the width of the connecting part of the U-shaped loop between the legs, and a depth which is essentially equal to the height of the connecting part of the U-shaped loop between the legs, and that the flat element is essentially thicker than the overall depth of the recesses.

3. Platform according to Claims 1-2, in which each flat element consists of several planks laid side by side, which are pierced and held together by a transverse binding at each end of the flat element, *characterized by the fact* that the holes in the flat element lie inside the binding irons.

4. Platform according to Claim 3, *characterized by the fact* that each of the holes in the flat elements is bordered by the inner part of a slot piercing its entire thickness, extending from the end of the element, and by binding irons passing crosswise through the slot.

Publications consulted:

Danish patents nos.	66,970; 71,548
Norwegian patents nos.	18,794; 57,937
Swedish patent no.	28,676
German patent no.	734,589

Henhører til beskrivelsen til
patent nr. 84807

Fig. 1

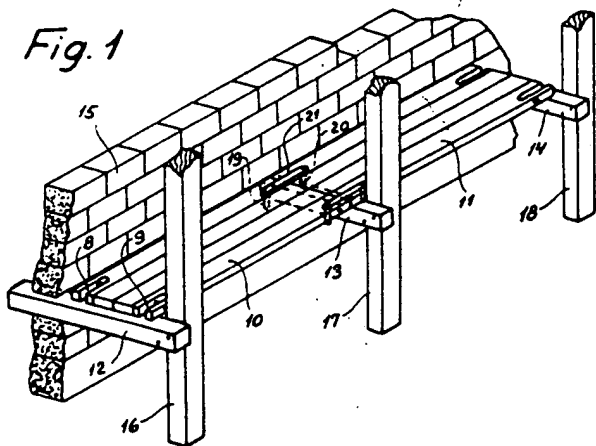


Fig. 2

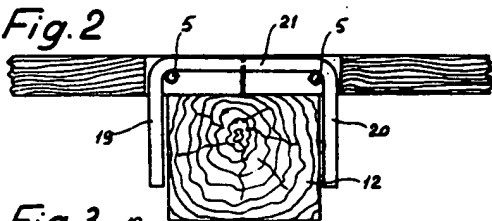


Fig. 3

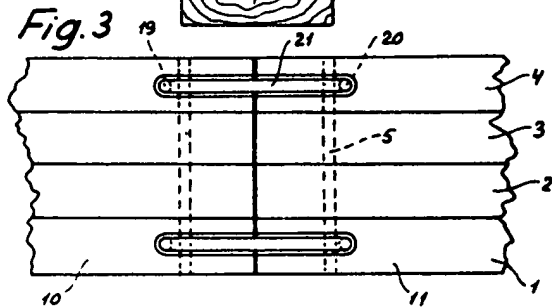


Fig. 4

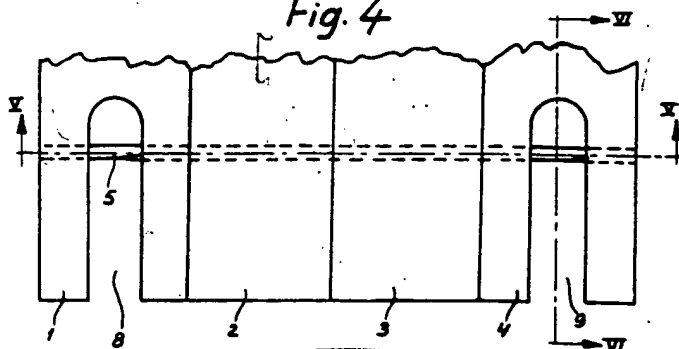


Fig. 5

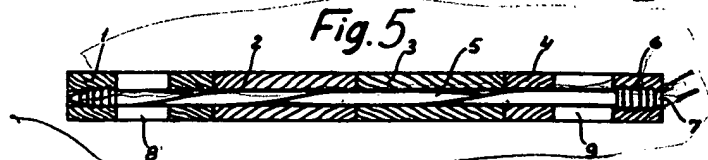
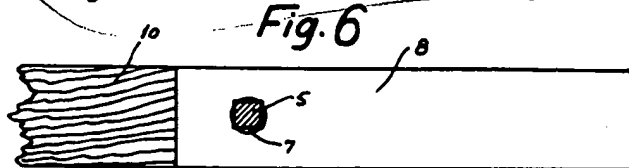


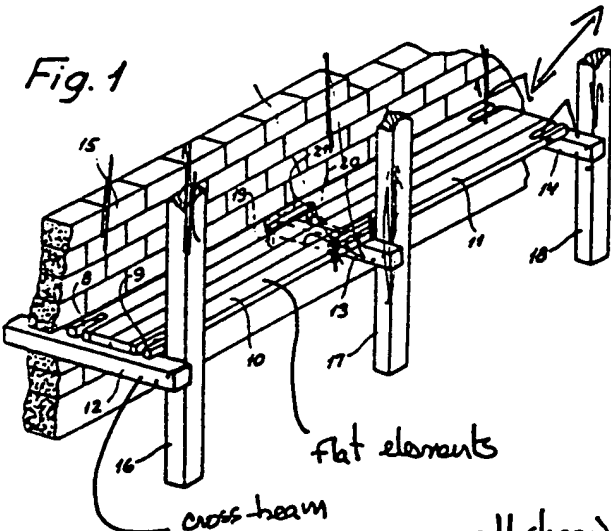
Fig. 6



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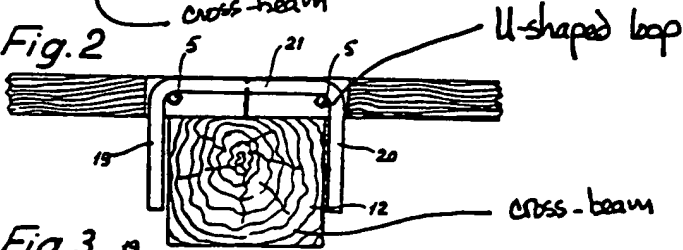
Fig. 1



flat elements

cross-beam

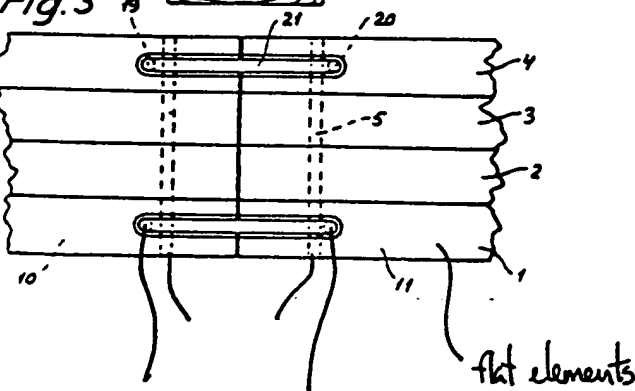
Fig. 2



U-shaped loop

cross-beam

Fig. 3



flat elements

U-shaped loop

U-shaped loop

Fig. 4

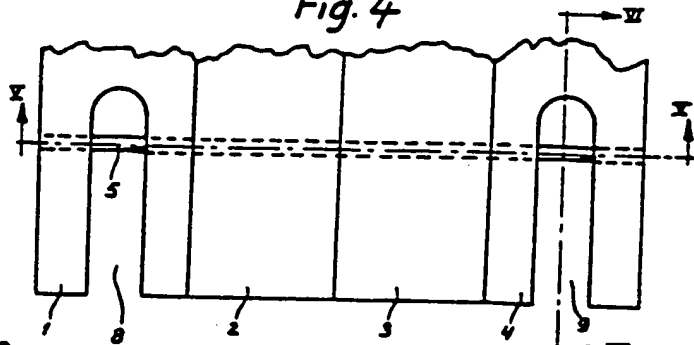
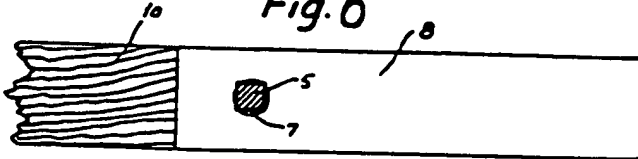


Fig. 5



Fig. 6



looks like pin has been twisted

- flat elements are supported by cross-beams having adjoining ends (?????)
- flat elements are in the longitudinal direction held together with the aid of U-shaped loops
- characterized in that at each end of each flat element there is one or more openings lying so far from the end of the element that they are not covered by the cross-beam
- in addition to the legs of the U-shaped element introduced into those holes

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LARSEN

Dansk Patent



Nr. 84807

EXAMINER'S
COPY

BESKRIVELSE

MED TILHØRENDE TEGNING

OFFENTLIGGJORT DEN 5. MAJ 1958

AF

DIREKTORATET FOR PATENT- OG VAREMÆRKEVÆSENET

DIREKTØR LARS PETER HOLGER LARSEN,

ARDEN.

Løbebro.

Patent udstedt den 6. januar 1958. Patenttiden løber fra den 14. december 1953.

Opfindelsen angår en løbebro bestående af fladeelementer, der er understøttet af tværbjælker ved de sammenstødende ender, og som i længderetningen er sammenholdt ved hjælp af U-formede bøjler.

Ved nogle af de kendte løbebroer af denne art er de U-formede bøjlers ben tilspidsede, således at bøjlerne kan slås ned i fladeelementerne, idet det ene ben af hver bøjle slås ned i et fladeelement nær dets ene ende, medens det andet ben af bøjlen slås ned i det hertil stødende fladeelement. Bøjlers ben er ikke så lange, at de kan trænge helt gennem fladeelementet. Denne samlingsmåde har den ulempe, at fladeelementerne, der oftest består af bræddeflager, ødelægges meget hurtigt ved inddrivningen af bøjlernes ben. Efter 4—5 ganges anvendelse er der så mange huller i brædderne, at de må udskiftes.

Ved andre kendte løbebroer er fladeelementerne sammenholdt ved hjælp af beslag, der er fastskruet eller fastboltet til fladeelementerne. Sådanne løbebroer er dog forholdsvis besværlige at montere, og endvidere er det uheldigt at anvende bolte eller skruer eller andre gevinddele, idet gevindene i praksis ikke kan holdes fri for mørtel og desuden hurtigt rustner i fri luft.

Opfindelsen har til formål at udforme løbebroen på en sådan måde, at den kan monteres let og hurtigt, uden at det er nødvendigt at drive søm eller andre fastholdelsesorganer ind i fladeelementernes materiale, idet man herunder udformer samlingen mellem fladeelementerne på en sådan måde, at den medvirker til at forhindre en længdeforskydning af fladeelementerne i forhold til tværbjælkerne.

Løbebroen ifølge opfindelsen er med dette formål for øje ejendommelig ved, at der ved hver ende af hvert fladeelement er udformet et

eller flere huller, der ligger så langt fra elementets ende, at de ikke dækkes af tværbjælken, samt at de i disse huller indførte ben af de U-formede bøjler rager et stykke ned under undersiden af elementerne. Ved samlingen af fladeelementerne stikkes det ene ben af en U-formet bøjle ned i et hul i et fladeelement, medens bøjlers andet ben stikkes ned i det overfor liggende hul i det tilstødende fladeelement. Samlingen er således meget let og hurtig at udføre. Da benene rager et stykke ned under undersiden af fladeelementerne, vil benene låse fladeelementerne i forhold til tværbjælken, idet de rager ned langs hver sin side af denne. Ved anvendelsen af de nævnte huller i fladeelementerne undgår man fuldstændig at bruge søm eller andre fastholdelsesorganer, der skal drives ind i træet. Som følge heraf får fladeelementerne langt længere levetid, i visse tilfælde 10—20 gange så lang levetid som fladeelementer, der skal sømmes til tværbjælkerne. Takket være hullerne i fladeelementerne kan endvidere de U-formede bøjler fremstilles meget simpelt, f. eks. blot ved bukning af et stykke stangjern.

For at opnå en fuldstændig eller delvis forsenkning af bøjlerne i fladeelementerne, således at disse sidste får en glat overflade, kan der ifølge opfindelsen i den ene eller begge sider af hvert fladeelement være udformet en udsparring fra hvert hul ud til endekanten, hvilken udsparring har en bredde, der i det mindste er lig med bredden af de U-formede bøjlers forbindelsesparti mellem benene, og en dybde, der i hovedsagen er lig med højden af de U-formede bøjlers forbindelsesparti mellem benene, idet fladeelementet dog i dette tilfælde skal være væsentlig tykkere end den samlede dybde af udsparringerne. Hvis der som angivet er udformet ud-

sparinger i begge sider af hvert fladeelement, kan fladeelementerne vendes efter nogen tids brug, hvis de er blevet slidt eller beskadiget på den opad liggende side. Herved kan levetiden yderligere forlænges.

Ved de fleste af de kendte løbebroer består hvert af fladeelementerne af flere ved siden af hinanden anbragte brædder, som gennemtrænges af og er sammenholdt med et tværgående forbindelsesjern ved hver ende af elementet. I dette tilfælde kan ifølge opfindelsen hullerne i fladeelementet være beliggende inden for forbindelsesjernene, hvorved man effektivt forhindrer, at materialet mellem et hul og den nærliggende endekant af fladeelementet rives ud ved overbelastning af forbindelsen mellem to elementer eller ved stød- eller slagpåvirkning.

Hvis de omtalte forbindelsesjern anvendes, kan ifølge opfindelsen hver af hullerne i fladeelementerne være begrænset af det indre parti af en fra enden af elementet udgående og hele elementets tykkelse gennemtrængende slidse og af et tværs gennem slidsen gående forbindelsesjern. Herved sparer man at bore huller og at foretage udsparinger fra hullerne til endekanten af elementet. I stedet skal blot skæres en gennemgående slidse af den nævnte art, hvilket er langt lettere. De U-formede bøjlers forbindelsespartier vil blive tilstrækkelig undersænket i elementerne, når de hviler på forbindelsesjernene, der sædvanligvis er inddrevet midt i tykkelsen af elementerne.

På tegningen er opfindelsen anskueliggjort skematisk, idet

fig. 1 er et perspektivisk billede af et stykke murværk med et stillads forsynet med en løbebro ifølge opfindelsen.

fig. 2 er et længdesnit gennem løbebroen i større målestok,

fig. 3 viser en del af løbebroen, set fra oven,

fig. 4 viser et endeparti af et fladeelement, set fra oven,

fig. 5 er et snit efter linien V—V i fig. 4, og

fig. 6 er et snit efter linien VI—VI i fig. 4.

På tegningen betegner 1, 2, 3 og 4 brædder, der i nærheden af hver ende er forbundet med et forbindelsesjern 5 i form af en snoet jernstang med kvadratisk tværsnit. Forbindelsesjernene 5 er inddrevet gennem cylindriske huller 7 i brædderne. I brædderne 1 og 4 er der fra enderne udformet slidser 8 og 9, der strækker sig lidt forbi forbindelsesjernene 5. Der er herved dannet fladeelementer, der i fig. 1 og 3 er betegnet ved 10 og 11. Disse er anbragt med deres ender hvilende på stikbomme 12, 13 og 14, som er støttet dels i murværk 15, dels på rejsebom-

me 16, 17 og 18. De to fladeelementer er anbragt med deres ender tæt op til hinanden. En U-formet bøjle med to grene 19 og 20 og et forbindelsesparti 21 er bragt i indgreb med forbindelsesjernene 5 i de to fladeelementer 10, 11, og grene 19 og 20 rager som vist i fig. 2 ned på hver sin side af stikbommen 12. Forbindelsesstykkerne 21 ligger forsænket i slidserne 8 og 9, så at ingen del rager op over oversiden af fladeelementerne. Der fås derfor en ganske jævn løbebro.

Patentkrav.

1. Løbebro bestående af fladeelementer, der er understøttet af tværbjælker ved de sammenstødende ender, og som i længderetningen er sammenholdt ved hjælp af U-formede bøjler, kendetegnet ved, at der ved hver ende af hvert fladeelement er udformet ét eller flere huller, der ligger så langt fra elementets ende, at de ikke dækkes af tværbjælken, samt at de i disse huller indførte ben af de U-formede bøjler rager et stykke ned under undersiden af elementerne.

2. Løbebro ifølge krav 1, kendetegnet ved, at der i den ene eller begge sider af hvert fladeelement er udformet en udsparring fra hvert hul ud til endekanten, hvilken udsparring har en bredde, der i det mindste er lig med bredden af de U-formede bøjlers forbindelsesparti mellem benene, og en dybde, der i hovedsagen er lig med højden af de U-formede bøjlers forbindelsesparti mellem benene, samt at fladeelementet er væsentlig tykkere end den samlede dybde af udsparringerne.

3. Løbebro ifølge krav 1—2, ved hvilken hvert fladeelement består af flere ved siden af hinanden anbragte brædder, som gennemtrænges af og er sammenholdt med et tværgående forbindelsesjern ved hver ende af elementet, kendetegnet ved, at hullerne i fladeelementet er beliggende inden for forbindelsesjernene.

4. Løbebro ifølge krav 3, kendetegnet ved, at hver af hullerne i fladeelementerne begrænses af det indre parti af en fra enden af elementet udgående og hele elementets tykkelse gennemtrængende slidse og af et tværs gennem slidsen gående forbindelsesjern.

Fremdragne publikationer:

Danske	patenter nr. 66970, 71548
Norske	patenter nr. 18794, 57937
Svensk	patent nr. 28676
Tysk	patent nr. 734589.

Danish Patent No. 34,807

Claim 1: Builder's ladder comprised of flat elements,
which are supported by crossbeams, ^{→ the flat elements} having adjoining ends,
and which in the longitudinal direction are held to-
gether with the aid of U-shaped loops, characterized in
that at each end of each flat element, ^{→ (?) → I don't see the holes in each element} there is one or
more openings lying so far from the end of the element
that they are not covered by the crossbeam, in addi-
tion to the legs of the U-shaped element introduced into
these holes projecting a little downward below the under
side of the element.

SPECIFICATION
with appurtenant drawing

PUBLISHED MAY 5, 1958

by

THE DANISH DIRECTORATE OF PATENTS, DESIGNS AND TRADEMARKS

LARS PETER HOLGER LARSEN, DIRECTOR

ARDEN

[handwritten annotation in English]: *Builder's ladder*

Walkway

Patent issued January 6, 1958. Patent valid as of December 14, 1953.

This invention concerns a walkway comprising surface elements supported by crossbeams at their contiguous ends and held together in their longitudinal direction by U-shaped clamps.

In some known walkways of this type, the legs of the U-shaped clamps are pointed, so that the clamps can be driven down into the surface elements, whereby one leg of each clamp is driven down into a surface element near the end thereof, while the other leg of the clamp is driven into the surface element in abutment therewith. The legs of the clamps are not of sufficient length to fully penetrate the surface element. This design has the disadvantage that the surface elements, which usually consist of planking, are destroyed very quickly as a result of the legs of the clamps being driven in. After four or five uses, there are so many holes in the planks that they must be replaced.

In other known walkways, the surface elements are held together by means of braces fixedly screwed or bolted to the surface elements. However, such walkways are comparatively more difficult to assemble, and the use of bolts, screws or other threaded components is also disadvantageous since, in practice, the threads cannot be kept free of mortar, and because they corrode rapidly in the open air.

The purpose of the invention is to produce a walkway that can be assembled easily and quickly, without the need to drive nails or other fastening devices into the material of the surface

elements, and wherein the joint between the surface elements is designed to help prevent the longitudinal displacement of the surface elements in relation to the crossbeams.

With this purpose in mind, the walkway according to the invention is characterized by the fact that each end of each surface element is provided with one or more holes located sufficiently far from the end of the element that they are not covered by the crossbeam, and that the legs of the U-shaped clamps inserted into these holes project downward a distance below the underside of the elements. To join the surface elements, one leg of a U-shaped clamp is inserted downward into one hole in a surface element, while the other leg of the clamp is inserted downward into the superjacent hole in the adjacent surface element. The joint may thus be made very quickly and easily. Because the legs project downward a distance below the underside of the surface elements, the clamps will lock the surface elements in relation to the crossbeam, since each leg extends downward along its own side of the crossbeam. The use of nails or other fastening devices that must be driven into the wood is entirely avoided through the use of said holes in the surface elements. As a result, the surface elements have far longer useful lives, in some cases as much as 10-to-20 times the useful lives of surface elements that must be nailed to the crossbeams. By virtue of the holes in the surface elements, the U-shaped clamps can also be made very simply, e.g., merely by bending a piece of bar iron.

In order to completely or partially countersink the clamps in the surface elements, in order to give the latter a smooth surface, one or both sides of each surface element can be provided, according to the invention, with a recess from each hole out to the terminal edge, which recess has a width that is at least equal to the width of the connecting section between the legs of the U-shaped clamps and a depth that is essentially equal to the height of the connecting section between the legs of the U-shaped clamps, since the surface element must still be considerably thicker than the combined depth of the recesses in this case. If both sides of each surface element are provided with recesses as described, then the surface elements can be turned over if their top sides should become worn or damaged after they have been used for some time. Their useful lives can thus be further extended.

In most known walkways, each of the surface elements comprises multiple planks arranged side by side and penetrated and held together by a transverse connecting iron at each end of the element. According to the invention, the holes in the surface element in this case can be arranged inside the connecting irons, thereby effectively preventing the material between a hole and the proximal terminal edge of the surface element from being torn out in the event of overloading of the joint between two elements, or by the effects of jolts or impacts.

According to the invention, if said connecting irons are used, each of the holes in the surface elements can be delimited by the inner part of a slot that extends outwardly from the end of the element and penetrates through the thickness of the entire element, and by a connecting iron that passes transversely through said slot. This eliminates the need for drilling holes and creating recesses from the holes to the terminal edge of the element. It is instead only necessary to cut a penetrating slot of the aforesaid type, which is far easier to do. The connecting sections of the U-shaped clamps will be sufficiently countersunk in the elements when they rest on the connecting irons, which are customarily driven midway into the thickness of the elements.

The invention is clarified schematically in the drawing, in which

Figure 1 gives a perspective view of a section of masonry with a scaffold provided with a walkway according to the invention,

Figure 2 shows a longitudinal section through the walkway on a larger scale,

Figure 3 shows a portion of the walkway in plan,

Figure 4 shows an end section of a surface element in plan,

Figure 5 is a section along line V - V of Figure 4 and

Figure 6 is a section along line VI - VI of Figure 4.

In the drawing, 1, 2, 3 and 4 denote planks that are joined near each of their ends by means of a connecting iron 5 in the form of a bent iron bar with a square cross-section. The connecting irons 5 are driven through cylindrical holes 7 in the planks. In the ends of planks 1 and 4 there are slots 8 and 9 proceeding from the ends and extending slightly beyond the connecting irons 5. Surface elements, which are denoted by 10 and 11 in Figures 1 and 3, are produced thereby. These surface elements are arranged with their ends resting on tie beams 12, 13 and 14, which are supported partly in the masonry 15 and partly on vertical posts 16, 17 and 18. The two surface elements are arranged with their ends tightly abutting each other. A U-shaped clamp with two forks 19 and 20 and a connecting section 21 is mounted in engagement with the connecting irons 5 in the two surface elements 10, 11, and each of the forks 19 and 20 projects downward on its own side of the tie beam 12, as shown in Figure 2. The connecting pieces 21 are countersunk in slots 8 and 9 so that no part thereof projects upwardly over the top of the surface elements. A completely smooth walkway is thereby produced.

CLAIMS

1. A walkway comprising surface elements supported by crossbeams at their contiguous ends and held together in their longitudinal direction by U-shaped clamps, characterized by the fact that each end of each surface element has one or more holes located sufficiently far from the end of the element that they are not covered by the crossbeam, and that the legs of the U-shaped clamps inserted into these holes project downward a distance below the underside of the elements.

2. A walkway according to Claim 1, characterized by the fact that one or both sides of each surface element according to the invention is provided with a recess from each hole out to the terminal edge, which recess has a width that is at least equal to the width of the connecting section between the legs of the U-shaped clamps and a depth that is essentially equal to the height of the connecting section between the legs of the U-shaped clamps, and that the surface element is considerably thicker than the combined depth of the recesses.

3. A walkway according to Claims 1 - 2, wherein each surface element comprises multiple planks arranged side by side and penetrated and held together by a transverse connecting iron at each end of the element, characterized by the fact that the holes in the surface element are located inside the connecting irons.

4. A walkway according to Claim 3, characterized by the fact that each of the holes in the surface elements is delimited by the inner part of a slot that extends outward from the end of the element and penetrates through the thickness of the entire element, and by a connecting iron that passes transversely through said slot.

Cited publications:

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Norwegian patents 18794, 57937
Swedish Patent 28676
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Copenhagen 1958. J. M. Schultz A/S

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